

JIN, et al., 10/759,234
13 March 2006 Amendment
Responsive to 13 December 2005 Office Action

1213.43404X00 | P-1263-US | 310300278US1
Page 2

BEST AVAILABLE COPY

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended) A map generation device, comprising:

an image appointment unit that receives user appointment of at least one position in a building existing within an aerial photograph to designate the at least one position as part of a building region;

a polygon extraction unit that extracts ~~pixels~~at least one pixel from pixels within the building region based on a result of discriminating a color of the pixels around the at least one position~~building region to compare whether the pixels are within a gray-level variance of a predetermined discrimination threshold~~, sets the building region to include extracted pixels as a portion of an extracted building region, and repeats the extract and set operations to expand the extracted building region with more extracted pixels, and then extracts a polygon line of the extracted building region; and

a vector generation unit that generates a vector of the polygon line of the extracted building region.

Claim 2 (Currently Amended) The map generation device according to claim 1, comprising a roof texture analysis unit that analyzes colors around the at least

JIN, et al., 10/759,234
13 March 2006 Amendment
Responsive to 13 December 2005 Office Action

1213.43404X00 | P-1263-US | 310300278US1
Page 3

one position to determine sample colors for discriminating, ~~a the~~ discrimination threshold, and a region searching range,

wherein the polygon extraction unit extracts at least one of the pixels to be included in the building region pixels based on a result of discriminating a similarity between a color of the pixels in the region searching range and the sample colors for discriminating, ~~and extracts a line around the extracted building region pixels as the polygon line.~~

Claim 3 (Previously Presented) The map generation device according to claim 2, wherein the roof texture analysis unit extracts a plurality of pixels from a predetermined region including the at least one position, and determines the sample colors for discriminating, the discrimination threshold, and the region searching range based on a result of statistically analyzing colors of the plurality of pixels.

Claim 4 (Previously Presented) The map generation device according to claim 3, wherein the roof texture analysis unit expands the region of the discrimination threshold and reduces the region searching range when a variance is large in the colors of the plurality of pixels extracted from the predetermined region including the at least one position.

Claim 5 (Previously Presented) The map generation device according to claim 1, wherein the polygon extraction unit extracts pixels largely different in color from adjacent pixels as edge pixels, determines boundary lines based on the edge

JIN, et al., 10/759,234
13 March 2006 Amendment
Responsive to 13 December 2005 Office Action

1213.43404X00 | P-1263-US | 310300278US1
Page 4

pixels, and expands the extracted building region to the boundary lines to correct the extracted building region.

Claim 6 (Previously Presented) The map generation device according to claim 1, wherein the polygon extraction unit rotates the extracted building region so as to set the polygon line of the extracted building region in a predetermined axis direction, and smoothes the polygon line.

Claim 7 (Previously Presented) The map generation device according to claim 1, comprising a polygon correction unit that, in a case where the polygon line extracted by the polygon extraction unit corresponds to a predetermined linking pattern, corrects the polygon line to one of a straight line and lines crossing each other at a predetermined angle.

Claim 8 (Previously Presented) The map generation device according to claim 1, comprising a structural analysis and integration unit that, in a case where a line of a building roof corresponds to a predetermined integration pattern, integrates the extracted building region so as to include the line.

Claim 9 (Currently Amended) The map generation device according to claim 8, wherein the structural analysis and integration unit integrates the building region at least once by a plurality of inputted positions.

JIN, et al., 10/759,234
13 March 2006 Amendment
Responsive to 13 December 2005 Office Action

1213.43404X00 | P-1263-US | 310300278US1
Page 5

Claim 10 (Previously Presented) The map generation device according to claim 1, comprising a ground projection unit that, in a case where the aerial photograph shows a building obliquely, corrects distortion due to a height of the building, and projects a building polygon shape on a ground.

Claim 11 (Previously Presented) A map delivery method, which is used to deliver a map by associating the map created by the map generation device according to claim 1 with the aerial photograph.

Claim 12 (Currently Amended) ~~A program for causing a computer~~ A computer program embodied in a computer-readable media to execute a map generation method, the method comprising:

receiving user appointment of at least one position in a building existing within an aerial photograph, to designate the at least one position as part of a building region;

extracting at least one pixel from pixels within the building region based on a result of discriminating a color of the pixels around the building region to compare whether the pixels are within a gray-level variance of a predetermined discrimination threshold, setting the building region to include extracted pixels as a portion of an extracted building region, and repeating the extracting and setting operations to expand the extracted building region with more extracted pixels, and then extracting a polygon line of the extracted building region; and

generating a vector of the polygon line of the extracted building region.

JIN, et al., 10/759,234
13 March 2006 Amendment
Responsive to 13 December 2005 Office Action

1213.43404X00 | P-1263-US | 310300278US1
Page 6

~~extracting pixels corresponding to an extracted building region based on a
result of discriminating a color around the at least one position, and extracting a
polygon line of the extracted building region; and
generating a vector of the polygon line of the extracted building region.~~

Claim 13 (Currently Amended) The computer program product according to
claim 12, comprising:

analyzing colors around the at least one position to determine sample colors
for discriminating, ~~a~~ the discrimination threshold, and a region searching range;

extracting building region pixels based on a result of discriminating a similarity
between a color of a roof of a building in the region searching range and the sample
colors for discriminating, and

extracting a line around the extracted building region pixels as the polygon
line.

Claim 14 (Previously Presented) The computer program product according to
claim 12, comprising:

extracting pixels largely different in color from adjacent pixels as edge pixels,
and determining boundary lines based on the edge pixels; and

expanding the extracted building region to the boundary lines to correct the
extracted building region.

Claim 15 (Previously Presented) The computer program product according to
claim 12, comprising:

JIN, et al., 10/759,234
13 March 2006 Amendment
Responsive to 13 December 2005 Office Action

1213.43404X00 | P-1263-US | 310300278US1
Page 7

rotating the extracted building region so as to set the polygon line of the extracted building region in a predetermined axis direction; and
smoothing the polygon line after the rotation.

Claim 16 (Previously Presented) The computer program product according to claim 12, comprising, in a case where the polygon line extracted corresponds to a predetermined linking pattern, correcting the polygon line to one of a straight line and lines crossing each other at a predetermined angle.

Claim 17 (Previously Presented) The computer program product according to claim 12, comprising:

in a case where a line of a building roof corresponds to a predetermined integration pattern, integrating the extracted building region so as to include the line;
and

integrating the building region including a plurality of inputted positions.

Claim 18 (Previously Presented) The computer program product according to claim 12, comprising, in a case where the aerial photograph shows a building obliquely, correcting distortion due to a height of the building, and projecting a building polygon shape on a ground.

JIN, et al., 10/759,234
13 March 2006 Amendment
Responsive to 13 December 2005 Office Action

1213.43404X00 | P-1263-US | 310300278US1
Page 8

Claim 19 (Currently Amended) A map generation method, comprising:
receiving user appointment of at least one position in a building existing within
an aerial photograph, to designate the at least one position as part of a building
region;

extracting at least one pixel from pixels within the building region based on a
result of discriminating a color of the pixels around the building region to compare
whether the pixels are within a gray-level variance of a predetermined discrimination
threshold, setting the building region to include extracted pixels as a portion of an
extracted building region, and repeating the extracting and setting operations to
expand the extracted building region with more extracted pixels, and then extracting
a polygon line of the extracted building region; and

generating a vector of the polygon line of the extracted building region.

~~extracting pixels corresponding to an extracted building region based on a
result of discriminating a color around the at least one position, and extracting a
polygon line of the extracted building region; and~~

~~generating a vector of the polygon line of the extracted building region.~~

Claim 20 (Previously Presented) The map generation device according to
claim 1, wherein the user appointment of the at least one position with respect to the
image appointment unit is executed manually, and wherein the operations of the
polygon extraction unit and the vector generation unit are executed automatically.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

☐ **BLACK BORDERS**

☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**

☐ **FADED TEXT OR DRAWING**

☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**

☐ **SKEWED/SLANTED IMAGES**

☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**

☐ **GRAY SCALE DOCUMENTS**

☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**

☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**

☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.